COMPAQ

Compaq ProLiant Cluster HA/F100 for Microsoft Windows 2000 Advanced Server

Supplement Guide

First Edition (February 2000)
Part Number 175694-001
Compaq Computer Corporation

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About This Guide

This guide is designed to be used as supplement instructions for installation and as a reference with the *Compaq ProLiant Cluster HA/F100 and HA/F200 Administrator Guide*.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in uppercase.
Type	When you are instructed to *type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed to *enter* information, type the information and then press the **Enter** key.

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Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

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Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

Rack Stability

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single rack installation.
- The racks are coupled together in a multiple rack installation.
- A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

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Compaq Technical Support

You are entitled to free hardware technical telephone support for your product for as long as you own the product. A technical support specialist will help you diagnose the problem or guide you to the next step in the warranty process.

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ[1]. This service is available 24 hours a day, 7 days a week.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for world wide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet at

http://www.compaq.com.

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level
- Detailed, specific questions

[1] For continuous quality improvement, calls may be recorded or monitored.

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Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq website by logging on to the Internet at

http://www.compaq.com.

Compaq Authorized Reseller

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers.

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Chapter 1

Introduction

This supplement guide provides the information needed for setting up the Compaq ProLiant Cluster HA/F100 with Microsoft Windows 2000 Advanced Server. It also provides information for migrating the cluster from Microsoft Windows NT Server 4.0, Enterprise Edition to Microsoft Windows 2000 Advanced Server.

Windows 2000 Advanced Server contains all of the features and functionality of the standard version of Windows 2000 Server, plus additional features for organizations that require higher levels of scalability, reliability, and availability. It provides system services for server clustering as a standard part of the product.

This guide should be used in conjunction with the following documents:

- Installation guide for the Compaq ProLiant server you are installing as cluster nodes.
- Installation guide for the interconnect adapter card of your choice
- Compaq StorageWorks Fibre Channel Host Adapter or Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter documentation
- *Compaq ProLiant Cluster HA/F100 and HA/F200 Administrator Guide*
- Compaq ProLiant Cluster HA/F100 Configuration Poster
- *Compaq StorageWorks RAID Array 4000 User Guide* or *Compaq StorageWorks RAID Array 4100 User Guide*
- Microsoft Windows 2000 Advanced Server documentation included with your operating system purchase

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Hardware Components

The Compaq ProLiant Cluster HA/F100 uses these hardware solution components:

- Two Compaq ProLiant servers
- One or more Compaq StorageWorks RAID Array 4000 or Compaq StorageWorks RAID Array 4100 (RA4000/4100)
- One Compaq StorageWorks Fibre Channel Storage Hub (7- or 12-port)
- One Compaq StorageWorks RA4000 Controller per RA4000/4100
- One Compaq StorageWorks Fibre Channel Host Adapter or Compaq StorageWorks 64-Bit/66-Mhz Fibre Channel Host Adapter per server (host bus adapter)
- Network interface cards (NICs)
- Gigabit Interface Converter-Shortwave (GBIC-SW) modules
- Cables
  - Multi-mode Fibre Channel cable
  - Ethernet crossover cable
  - Network (LAN) cable

Software Components

The Compaq ProLiant Cluster HA/F100 uses these software solution components:

- Microsoft Windows NT Server 4.0, Enterprise Edition or Microsoft Windows 2000 Advanced Server purchase from your Microsoft reseller
- Compaq SmartStart and Support Software CD delivered with servers
- Compaq Cluster Verification Utility (CCVU) CD delivered with the cluster kit

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Chapter 2

Installing Microsoft Windows 2000 Advanced Server on an HA/F100 Cluster

The following information describes the software installation steps for the HA/F100 using Microsoft Windows 2000 Advanced Server. Proceed with these steps once you have all equipment installed and your hubs, storage system, and one node powered up. Refer to the *Compaq ProLiant Cluster HA/F100 and HA/F200 Administrator Guide* for preinstallation guidelines and hardware installation procedures.

You need the following during installation:

- Compaq SmartStart for the Servers CD delivered with servers
- Compaq SmartStart for Servers Setup Poster delivered with servers
- Server Profile Diskette (included with SmartStart) delivered with servers
- Microsoft Windows 2000 Advanced Server software and documentation included with your operating system purchase
- Compaq Cluster Verification Utility (CCVU) CD delivered with the cluster kit
- At least 10 high-density diskettes

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Assisted Integration Using SmartStart (Recommended)

IMPORTANT: Prior to the installation of Microsoft Windows 2000 Advanced Server, upgrade the system ROM on each node with the latest ROMPAQ from the Compaq website at http://www.compaq.com/support.

Use the SmartStart Assisted Integration procedure to configure the servers (nodes) in the HA/F100 configuration. You will set up two nodes during this process. Go through all steps on each of the nodes with noted exceptions. The following steps will take you through the SmartStart Assisted Integration procedure.

CAUTION: Installation using SmartStart assumes that SmartStart is being installed on new nodes. Any existing data on the nodes' boot drive will be erased.

Cluster-Specific SmartStart Installation

The SmartStart setup poster describes the general flow of configuring and installing software on a single node. The installation for a Compaq ProLiant Cluster HA/F100 will be very similar. The difference between running SmartStart on a stand-alone node and running SmartStart for a cluster is that you can configure the shared drives using the Compaq Array Configuration Utility. For cluster configuration, configure the drives on the first node, and then accept the same settings for the shared drives if given the option on the second node.

Assisted Integration Steps

To install your cluster using the Assisted Integration path, follow these steps:

IMPORTANT: Node 2 must be powered off when setting up Node 1.

1. Power up your hardware in the following manner:
   a. Storage hub (power is applied when the AC cord is plugged in)
   b. Shared storage (wait for drives to spin up)
   c. Power up Node 1 and place the SmartStart CD in the CD-ROM drive. The CD will automatically run.
2. Select the **Assisted Integration** installation path. Follow the steps outlined in the SmartStart Setup Poster.

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3. When SmartStart prompts for the operating system, select **Microsoft Windows 2000 Advanced Server.**
4. After the hardware configuration has run, press **Enter**. SmartStart will automatically run the Array Configuration Utility.

IMPORTANT: Node 2 Exception: In Step 5 when configuring Node 2, the Array Configuration Utility shows the results of the shared drives configured during Node 1 setup. Accept these changes for Node 2 by exiting the Array Configuration Utility.

NOTE: Create a logical drive with 100 MB of space to be used as the quorum disk.

5. Choose the custom configuration option to create RAID sets on your RA4000/4100 storage system. Refer to the user guide for the RA4000 or RA4100 for more details.
6. After you have completed using the Array Configuration Utility, the system will reboot and SmartStart will automatically create your system partition.
7. Next, you will be guided through steps to install additional Compaq software and utilities including choosing the boot partition size. Continue to follow the instructions in the SmartStart setup poster.

IMPORTANT: Node 2 Exception: In Step 8 when configuring Node 2, exit out of the Diskette Builder Utility and go to Step 9.

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8. After the Diskette Builder Utility has loaded, create the Options ROMPaq in Diskette Builder and label the diskettes you create. The Options ROMPaq utility updates the firmware on the array controllers and the hard drives. For more information about Options ROMPaq, refer to the user guide for your RA4000 or RA4100.
9. The node will reboot to prepare for the operating system installation. When prompted, insert the Microsoft Windows 2000 Advanced Server CD.
10. After Microsoft Windows 2000 Advanced Server has installed, open Disk Management and create disk partitions.
11. Exit and remove the SmartStart CD.
12. Power down the node, insert the Options ROMPaq diskette in Node 1, and restart the node.

IMPORTANT: In Step 13 when updating the firmware on the array controllers, make sure that Node 2 is powered off.

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IMPORTANT: Node 2 Exception: Do not update the firmware on the array controllers when setting up Node 2.

13. Run Options ROMPaq from diskettes and choose to update the firmware on the array controllers.
14. Power down the storage and node after firmware update completes.
15. Power on the storage and wait for drives to spin up, then power on the node.
16. Power up Node 2 and place the SmartStart CD in the CD-ROM drive. Repeat steps 1-9 to install Windows 2000 Advanced Server on Node 2 skipping only the steps indicated by the Node 2 exceptions.

NOTE: The possibility exists that Microsoft has not digitally signed the drivers. If this is the case, when a driver is being installed, a dialog box will pop up notifying you that driver has not been digitally signed. Select **YES** on each of these boxes to install the driver without the digital signature.

NOTE: Check the Compaq website (http://www.compaq.com/support) for the latest Compaq Support Paq.

17. Verify that all installed drivers are current by running the Compaq Support Paq for Microsoft Windows 2000 on both nodes. This is done by inserting the SmartStart CD and selecting **Start**, and then **Run**. In the dialog box that displays, type **X:\cpqsupsw\ntcps\setup.exe** where X is the drive letter associated with your CD-ROM drive.
18. Run the Compaq Cluster Verification Utility (CCVU) to ensure that your hardware is ready for cluster installation.

    Use the Compaq Cluster Verification Utility CD in your cluster kit to install the Compaq Cluster Verification Utility. Refer to the CCVU online help for detailed information on running CCVU.

IMPORTANT: When setting up the cluster, both nodes must have the operating system installed prior to installing and configuring Cluster Service.

19. Install and configure the Cluster Service component on Node 1.

NOTE: Refer to the Microsoft Windows 2000 Advanced Server documentation for details on installing and configuring Cluster Service.

20. After Cluster Service has been installed and configured for Node 1, install and configure Cluster Service for Node 2.

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21. Run CCVU again to verify successful cluster installation.
22. Install your applications and monitoring and management software. Refer to the Compaq Insight Manager Installation Poster for information on installing Compaq Insight Manager on the management console and Insight Management Agents on servers and desktops.

For additional information on Windows 2000 Advanced Server visit the Microsoft website (http://www.microsoft.com) or the Compaq High Availability website (http://www.compaq.com/highavailability).

Manual Configuration Using SmartStart

Performing a manual configuration with SmartStart minimizes SmartStart's involvement. The manual configuration routine runs Compaq's System Configuration Utility. When you are prompted for the Microsoft Windows 2000 Advanced Server CD, SmartStart transfers the installation procedure to Windows 2000 Advanced Server. Follow the instructions on the Windows 2000 Advanced Server installation screens.

IMPORTANT: Prior to the installation of Microsoft Windows 2000 Advanced Server, upgrade the system ROM on each node with the latest ROMPAQ from the Compaq website at http://www.compaq.com/support.

Use the SmartStart manual configuration procedure to configure the servers (nodes) in the HA/F100 configuration. You will set up two nodes during this process. Go through all steps on each of the nodes with noted exceptions. The following steps will take you through the SmartStart manual configuration procedure.

CAUTION: Installation using SmartStart assumes that SmartStart is being installed on new nodes. Any existing data on the nodes' boot drive will be erased.

Cluster-Specific SmartStart Installation

The SmartStart setup poster describes the general flow of configuring and installing software on a single node. The installation for a Compaq ProLiant Cluster HA/F100 will be very similar. The difference between running SmartStart on a stand-alone node and running SmartStart for a cluster is that you can configure the shared drives using the Compaq Array Configuration Utility. For cluster configuration, configure the drives on the first node, and then accept the same settings for the shared drives if given the option on the second node.

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Manual Configuration Steps

To perform a manual installation, follow these steps:

IMPORTANT: Power off Node 2 when setting up Node 1.

1. Power up your hardware in the following manner:
   a. Storage hub (power is applied when the AC cord is plugged in)
   b. Shared storage (wait for drives to spin up)
   c. Power up Node 1 and place the SmartStart CD in the CD-ROM drive. The CD will automatically run.
2. Select **Manual Configuration** as the SmartStart installation path. Follow the steps outlined in the SmartStart Setup Poster.
3. When SmartStart prompts for the operating system, select **Microsoft Windows 2000 Advanced Server.**
4. After the hardware configuration has run, press **Enter**. SmartStart will automatically run the Array Configuration Utility.

IMPORTANT: Node 2 Exception: In Step 5 when configuring Node 2, the Array Configuration Utility shows the results of the shared drives configured during Node1 setup. Accept these changes for Node 2 by exiting the Array Configuration Utility.

NOTE: Create a logical drive with 100 MB of space to be used as the quorum disk.

5. Choose the custom configuration option to create RAID sets on your RA4000/4100 storage system. Refer to the user guide for the RA4000 or RA4100 for more details.

IMPORTANT: Node 2 Exception: When configuring Node 2, do not run the Diskette Builder Utility and go to Step 12.

6. After you have completed using the Array Configuration Utility, the node will reboot. Select the Create Support Software button that loads the Diskette Builder Utility. After it has loaded, create the Options ROMPaq and label the diskettes you create. The Options ROMPaq utility updates the firmware on the array controllers and the hard drives. For more information about Options ROMPaq, refer to the user guide for the RA4000 or RA4100.
7. Exit and remove the SmartStart CD.

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IMPORTANT: In Step 8 when updating the firmware on the array controllers, make sure that Node 2 is powered off.

8. Power down the node, insert the Options ROMPaq diskette in Node 1, and restart the node.

IMPORTANT: Node 2 Exception: Do not update the firmware on the array controllers when setting up Node 2.

9. Run Options ROMPaq and choose to update the firmware on the array controllers.
10. Power down the storage and node after firmware update completes.
11. Power on the storage and wait for drives to spin up, then power on the node.
12. Insert the Microsoft Windows 2000 Advanced Server CD and install the operating system.
13. Power up Node 2 and place the SmartStart CD in the CD-ROM drive. Repeat steps 1-12 to install Windows 2000 Advanced Server on Node 2 skipping only the steps indicated by the Node 2 exceptions.

NOTE: Check the Compaq website (http://www.compaq.com/support) for the latest Compaq Support Paq.

NOTE: The possibility exists that Microsoft has not digitally signed the drivers. If this is the case, when a driver is being installed, a dialog box will pop up notifying you that driver has not been digitally signed. Select **YES** on each of these boxes to install the driver without the digital signature.

14. Verify that all installed drivers are current by running the Compaq Support Paq for Microsoft Windows 2000 on both nodes. This is done by inserting the SmartStart CD and selecting **Start,** and then **Run**. In the dialog box that displays, type **X:\cpqsupsw\ntcps\setup.exe** where X is the drive letter associated with your CD-ROM drive.
15. Run the Compaq Cluster Verification Utility (CCVU) to ensure that your hardware is ready for cluster installation.

    Use the Compaq Cluster Verification Utility CD in your cluster kit to install the Compaq Cluster Verification Utility. Refer to the CCVU online help for detailed information on running CCVU.

IMPORTANT: When setting up the cluster, both nodes must have the operating system installed prior to installing and configuring Cluster Service.

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16. Install and configure the Cluster Service component on Node 1.

    NOTE: Refer the Microsoft Windows 2000 Advanced Server documentation for details on installing and configuring Cluster Service.

17. After Cluster Service has been installed and configured for Node 1, install and configure Cluster Service for Node 2.
18. Run CCVU again to verify successful cluster installation.
19. Install your applications and monitoring and management software. Refer to the Compaq Insight Manager Installation Poster for information on installing Compaq Insight Manager on the management console and Insight Management Agents on servers and desktops.

For additional information on Windows 2000 Advanced Server visit the Microsoft website (http://www.microsoft.com) or the Compaq High Availability website (http://www.compaq.com/highavailability).

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Chapter 3

Microsoft Windows NT Server 4.0, Enterprise Edition, to Windows 2000 Advanced Server Migration

This chapter outlines the migration from Microsoft Windows NT Server 4.0, Enterprise Edition to Windows 2000 Advanced Server for the Compaq ProLiant Cluster HA/F100. Use this information with the Microsoft Windows 2000 Advanced Server documentation.

Premigration Concerns

The cluster can be migrated to Windows 2000 Advanced Server without migrating the primary domain controller. However, if the cluster is used as a backup domain controller, the primary domain controller must be migrated first. For more detailed information on migrating domain controllers, refer to your Microsoft Windows 2000 Advanced Server documentation included with your operating system purchase.

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Migrating the Cluster

To migrate your cluster, follow these steps:

1. Move all of the cluster groups, including the cluster group, to Node 2.

   NOTE: For help on moving cluster groups, refer the Microsoft documentation that came with your operating system.

2. Upgrade Node 1 to Windows 2000 Advanced Server.

   a. Run the Compaq Windows 2000 Primer Utility to remove any conflicting device drivers or applications that may cause problems during the install or operation of Windows 2000 Advanced Server. The Primer Utility can be downloaded from the Compaq website (http://www.compaq.com/partners/microsoft/). After the Primer has run, you will be asked to reboot the node to finish the cleanup process.

   b. Once the node has been rebooted, insert the Windows 2000 Advanced Server CD into the CD-ROM drive. If the Autorun feature for CDs has been turned off, select **Start** and then **Run**. At the prompt type **X:\Setup.exe**, where X is the drive letter of your CD-ROM drive. When asked if you want to upgrade Windows, select **Yes**.

   c. Follow on-screen instructions for the End User License Agreement and your Microsoft Windows 2000 Advanced Server Product Key.

   d. The install process is completely automated and does not require any intervention until you are required to log on to the node.

   e. Configure Windows 2000 Advanced Server.

      NOTE: After the upgrade is complete, the Cluster Service will fail to start. This is because the DNS client for Node 1 has not been set up. The problem that occurs is an authentication error with the user account used to start the Cluster Service. The error message is expected and will be resolved after the DNS client is set up.

   f. Set up the DNS client on Node 1.

   g. After the DNS client setup is complete, select **Start** and then **Shutdown**. At the shutdown screen, select **Log Off Administrator**, then log back on to the machine. This ensures that the domain controller has properly authenticated the machine and user ID.

      NOTE: Check the Compaq website (http://www.compaq.com/support) for the latest Compaq Support Paq.

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NOTE: The possibility exists that Microsoft has not digitally signed the drivers. If this is the case, when a driver is being installed, a dialog box will pop up notifying you that driver has not been digitally signed. Select **YES** on each of these boxes to install the driver without the digital signature.

h. Verify that all installed drivers are current by running the Compaq Support Paq for Microsoft Windows 2000. This is done by inserting the SmartStart CD and selecting **Start** and then **Run**. In the dialog box that displays, type **X:\cpqsupsw\ntcps\setup.exe** where X is the drive letter associated with your CD-ROM drive.

i. After the installation is completed, the Compaq Support Paq window will reflect the drivers that were updated and the drivers that were not installed due to a current version of the driver on the node or due to a lack of hardware on the node.

j. To confirm that Cluster Service has started and Node 1 has rejoined the cluster, open Cluster Administrator by clicking on **Start, Programs, Administrative Tools, Cluster Administrator**. As the Cluster Administrator opens, an error will be reported. This error is a result of the additional resources Windows 2000 Advanced Server offers in Cluster Service. This error will go away when Node 2 is upgraded to Windows 2000 Advanced Server. Select **Yes To All** on the error dialog box to open Cluster Administrator.

3. Move all resources to Node 1.

4. Upgrade Node 2 by following the substeps in Step 2.

For additional information on migrating to Windows 2000 Advanced Server, visit the Microsoft website (http://www.microsoft.com) or the Compaq High Availability Website (http://www.compaq.com/highavailability).

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Appendix A

Software and Firmware Versions

This appendix lists the latest software and firmware versions needed for Compaq ProLiant Cluster HA/F100 for Microsoft Windows 2000 Advanced Server.

IMPORTANT: Refer to the Compaq High Availability website (http://www.compaq.com/highavailability) for information about software and firmware updates recommended or required for your Compaq ProLiant Cluster.

Table A-1
Supported Software/Firmware Versions

Software/Firmware Title	Version
Compaq SmartStart and Support Software CD	4.60 or later
Compaq Support Paq for Microsoft Windows 2000	5.00 or later
Compaq StorageWorks RA4000 Array Controller firmware	2.44 or later
Options ROMPaq from Diskette Builder	2.56

continued

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Table A-1
Supported Software/Firmware Versions *continued*

Software/Firmware Title	Version
Compaq Cluster Verification Utility	3.1 or later
Compaq Insight Manager with Compaq Insight Manager XE	4.60 or later (optional)

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